INSTRUCTION MANUAL

DC POWER SUPPLY

MZ33A

Anritsu

MP MASTER
MA23278

INSTRUCTION MANUAL

DC POWER SUPPLY

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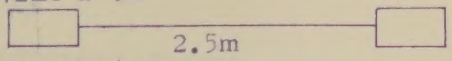
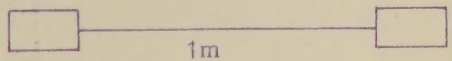
N O T E

The power supply voltage in this instruction manual is indicated without digits as AC [* *] V.

The power supply voltage of this instrument is AC [240] V.

Actual Accessories of MZ33A

Item	Q'ty	Remarks
AC cord	1	RM12BPG-3S — 2.5m — AC Plug 
DC cord	1	RM12BPG-6P — 1m — Plug 
Fuse	2	1A...1, 10A...1
Battery cell	3	Enclosed-type Lead Storage Battery PE7-6 (6V, 7AH)
Instruction manual	1	English

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SECTION I

FUNCTIONAL PURPOSE

The DC Power Supply MZ33A is used as a power source for the Spectrum Analyzer MS62A/B outdoors. The MZ33A operates with an external DC power supply and provided inside lead storage battery (optional). It incorporates a battery charger.

SECTION II

COMPOSITION AND SPECIFICATIONS

2.1 Composition

The MZ33A consists of the following:

Table 2-1 Composition

	Description	Q'ty	Remarks
Instrument	MZ33A	1	
Accessories	AC cord	1	RM12BPG-3S — 3m — AC Plug
	DC cord	1	RM12BPG-6P — 1m — Plug
	Fuse	2	1A---1, 10A---1, spare
	Instruction manual	1	
Optional	Battery cell	3	Enclosed-type Lead Storage Battery PE7-6 (6V, 7AH)

2.2 Specifications

Table 2-2 Specifications

Input voltage and current	DC 11 to 14V, less than 5A at DC 12V DC 17 to 26V, less than 3A at DC 21V
Provided inside battery (optional)	PORTARACK PE7-6 (manufactured by JAPAN STORAGE BATTERY CO., LTD.) 6V, 7AH, 3 pcs.
AC Input voltage (for charge)	AC ** V ±10%

SECTION III

PRINCIPLE OF OPERATION

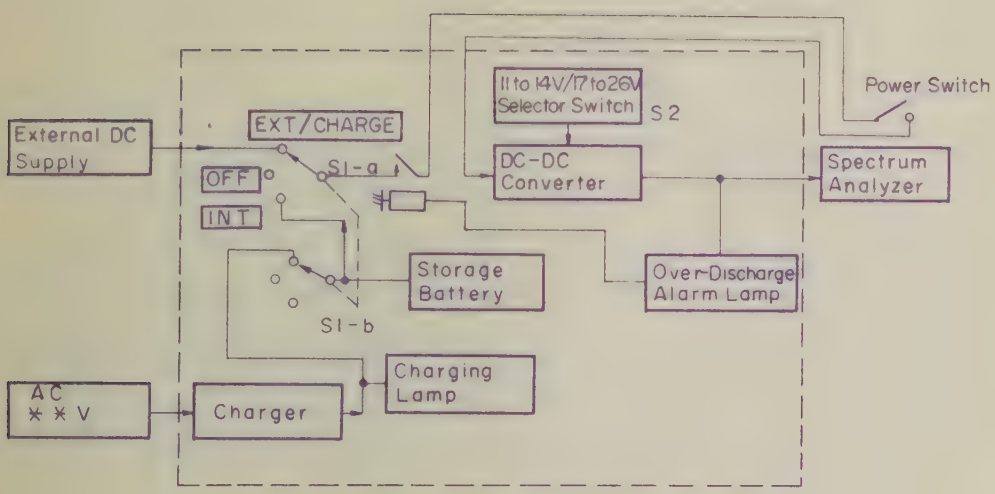


Fig. 3-1 Block Diagram

3.1 External DC Power Supply Operation

In Fig. 3-1, S1 is set to EXT/CHARGE and S2 is set to "11 to 14V" or "17 to 26V" depending on the external DC power supply to be used. S2 changes the number of the primary winding turns of the DC-DC converter. When the POWER switch of the MS62A/B is set to ON, an output of ±35V is obtained at the secondary winding of the transformer to operate the MS62A/B.

3.2 Provided Inside Storage Battery Operation

The provided inside storage battery has a capacity of 18V (three 6V cells connected in series). When S1 is set to INT and

S2 is set to "17 to 26V", the instrument operates as described in par. 3.1.

When S2 is set to "11 to 14V", the provided inside storage battery will not operate. When battery terminal voltage becomes less than the specified value due to discharge, over-discharge alarm lamp LOW BATTERY comes on and DC power supply is not supplied to MS62A, B by operating a relay to prevent over-discharge of storage battery.

3.3 Charge

In Fig. 3-1, when S1 is set to EXT/CHARGE, the battery charger is connected to the battery. When AC ** V is input, charging starts and the charging lamp lights up with a beam intensity proportional to the charging current. If the charging lamp does not come on, recharging is not required. After the battery is discharged until the LOW BATTERY lamp comes on, recharging can be completed in approximately 10 hours.

SECTION IV

OPERATION

4.1 Terminals and Controls

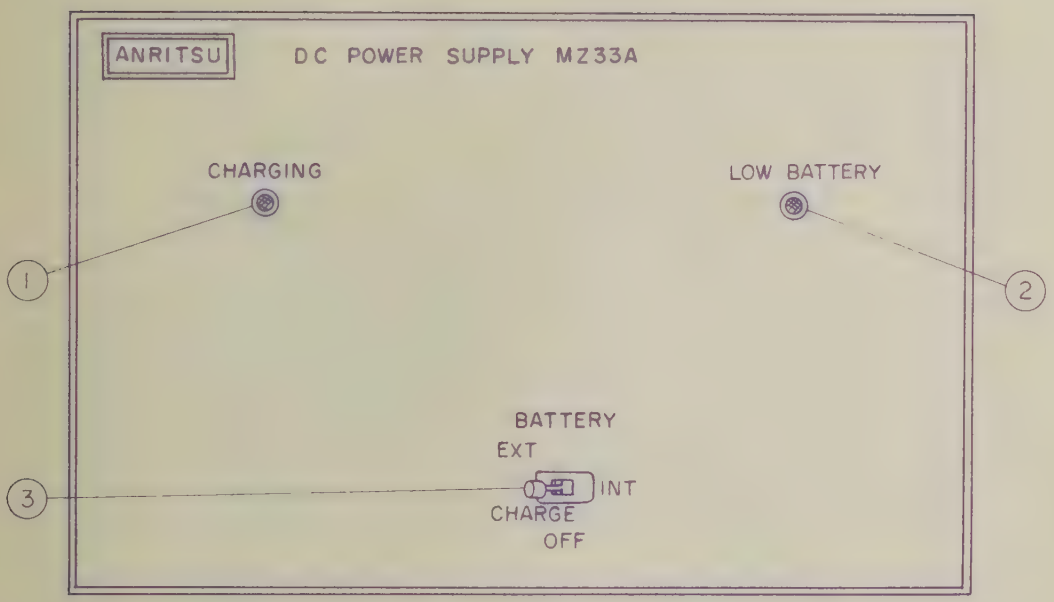


Fig. 4-1 Front View

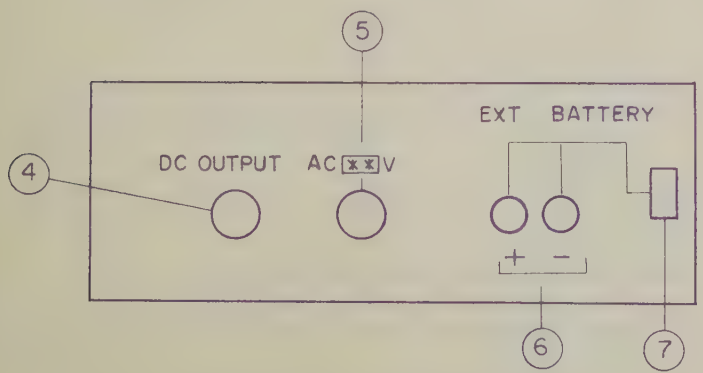


Fig. 4-2 Rear View

①	CHARGING lamp	Indicates that battery is being charged. It comes on with a beam intensity proportional to the charging current.
②	LOW BATTERY lamp	Over-discharge alarm lamp. When this lamp comes on, the MS62A/B will not operate.
③	Power supply and charging selector switch	When using an external DC power supply and/or charging the battery, set the switch to EXT/CHARGE as shown in Fig. 4-1. When the switch is set to OFF, the charging and discharging circuits are cut off. When the switch is set to INT, this Power Supply operates with the provided inside storage battery.
④	DC OUTPUT	DC Output terminal. It is connected to the MS62A/B with the cord furnished.
⑤	AC ⊠ V	Input terminal for the charging AC ⊠ V cord furnished.
⑥	EXT BATTERY input terminals	Connection terminals for external DC power supply. (For connection, see step (1), par. 4.2 "Operation with an External DC Power Supply".)
⑦	EXT BATTERY selector switch	"11 to 14V" or "17 to 26V" is selected in accordance with external DC power supply voltage to be used.

4.2 Operation with an External DC Power Supply

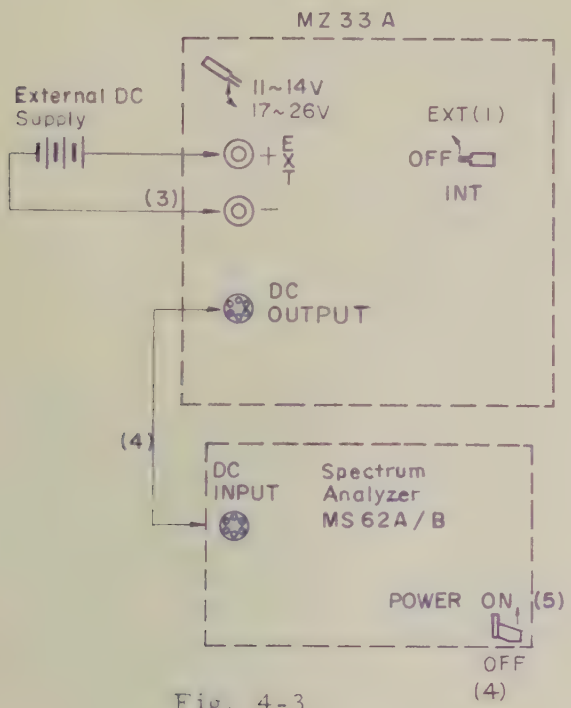


Fig. 4-3

(1) Set switch (3) on the front panel of the MZ33A to EXT/CHARGE.

(2) Set selector switch (7) in accordance with the external power supply voltage to be used.

(3) Connect an external DC power supply (allowing for a capacity higher than 4A at any voltage from 11 to 14V or a capacity higher than 2.5A at any voltage from 17 to 26V) to EXT BATTERY input terminals (6) on the rear panel of the MZ33A. Be careful to prevent terminal polarity failure.

(4) Set the power switch of the MS62A/B to OFF. Connect DC OUTPUT (4) of the MZ33A to the DC INPUT terminal of the MS62A/B.

(5) Turn on the external power switch. Turn on the power switch of the MS62A/B. Then operation will start.

4.3 Operation with Provided Inside Storage Battery

(1) Set switch (3) to INT.

(2) Set switch (7) to "17 to 26V".

(3) Connect this instrument to the MS62A/B in accordance with the procedure described in step (4), par. 4.2.

(4) Turn on the power switch of the MS62A/B.

(5) Recharge the battery immediately when the LOW BATTERY lamp comes on.

4.4 Charging Procedure

(1) Set switch (3) to EXT/CHARGE.

(2) Connect the cord furnished to AC [**] V input terminal (5). Insert the plug, and charging will start.

(3) If CHARGING lamp (1) on the front panel does not light up, this shows that the battery has already been charged. It may be used directly or stored.

(4) When recharging is performed after discharging until the LOW BATTERY lamp comes on, the CHARGING lamp lights up brightly to show that a recharging current is flowing. Lamp beam intensity is nearly constant during a recharging period of time from 4 to 5 hours. After that, the intensity becomes gradually lower and the lamp goes out in approximately 10 hours when charging is completed.

SECTION V

MAINTENANCE

5.1 Precautions

(1) Rechage the provided inside storage battery immediately when the LOW BATTERY lamp comes on during the battery operation.

(2) Perform recharging every 5 or 6 months even if the instrument is left unused.

(3) When storing the instrument for a long period, fully recharge its battery and then store it in a cool place.

(4) Do not short-circuit terminals and do not permit them to come near fire. Otherwise, fire damage may result.

5.2 Battery Cell Replacement Procedure (See Fig. 5-1.)

(1) Remove the top panel and side panels from the chassis.

(2) Remove screws (4 screws each side) from the battery cover, and remove the cover.

(3) Replace 3 battery cells as a set.

If cells having different levels of deterioration are used in series, the battery may simply perform at the level of the worst cell, and there is also the chance that when the battery bank is recharged, unbalanced recharging will shorten the life of the batteries.

(4) Be very careful to prevent the terminals from being short-circuited when replacing the battery cells.

5.3 Provided Inside Storage Battery Performance Data

The performance data are shown in Figs. 5-2 to 5-4.

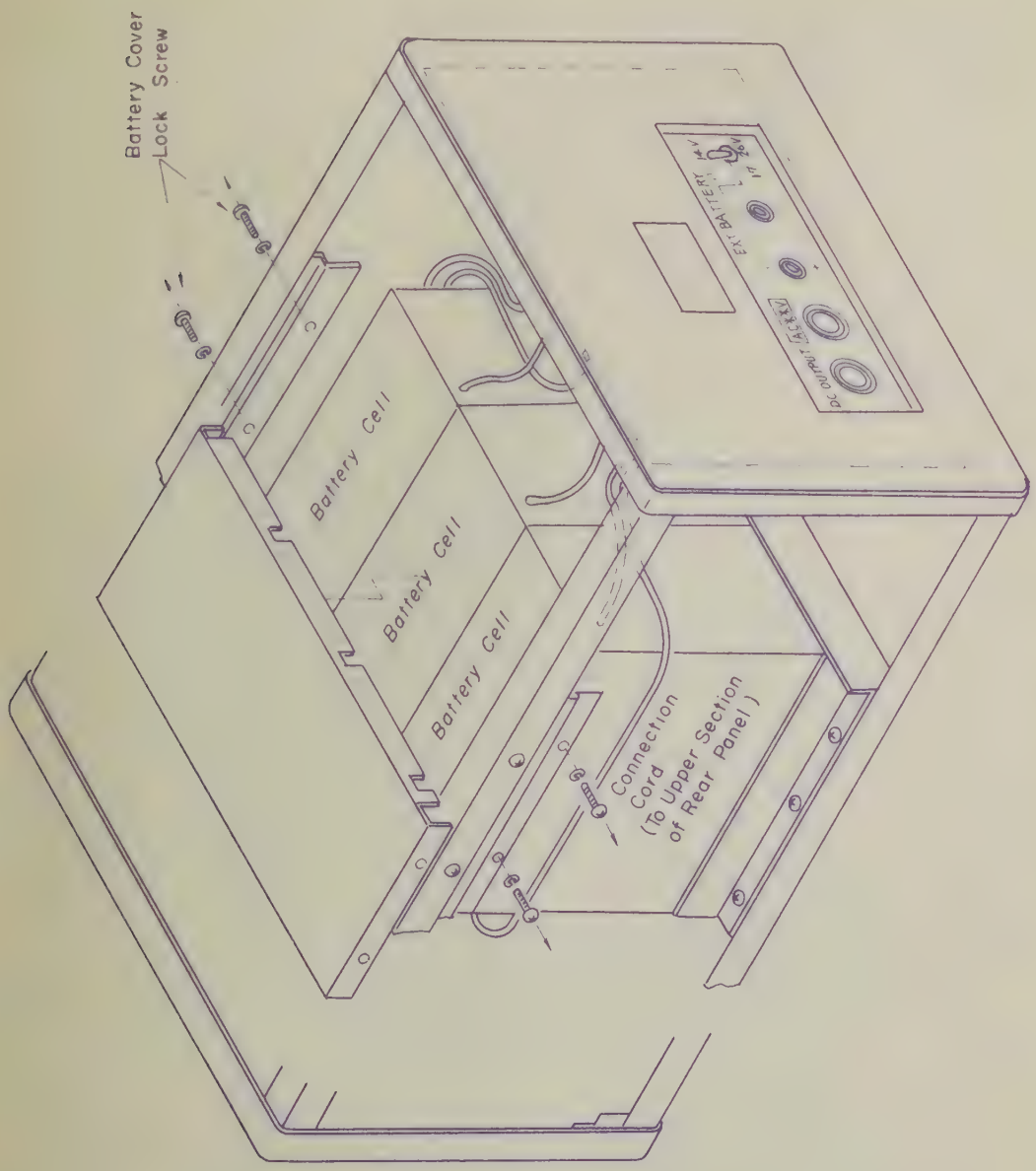


Fig. 5-1 Battery Replacement

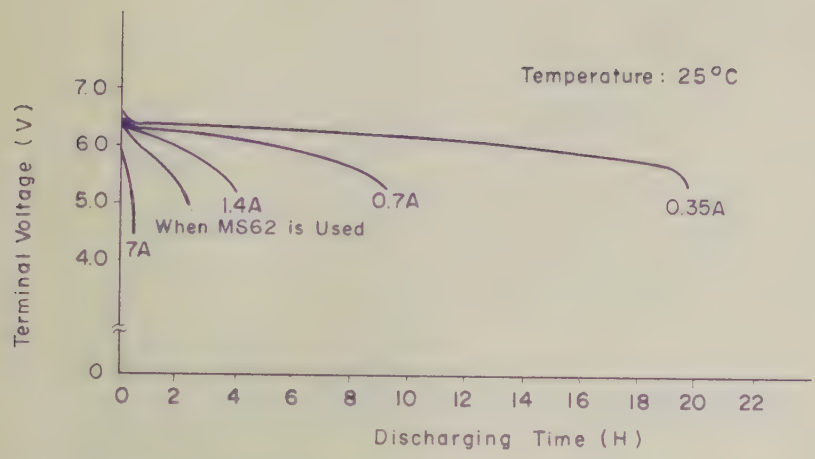


Fig. 5-2 Typical Discharging Performance

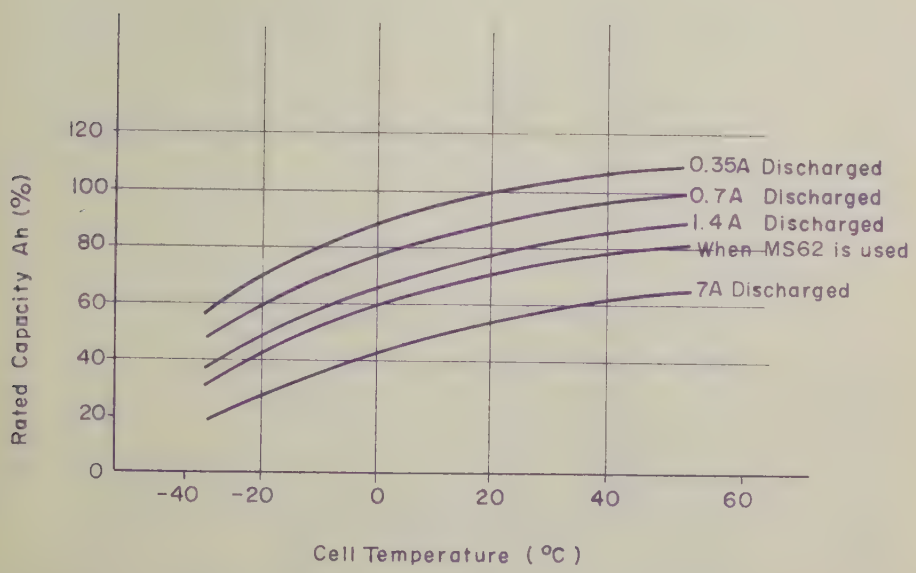


Fig. 5-3 Temperature-Capacity Characteristics

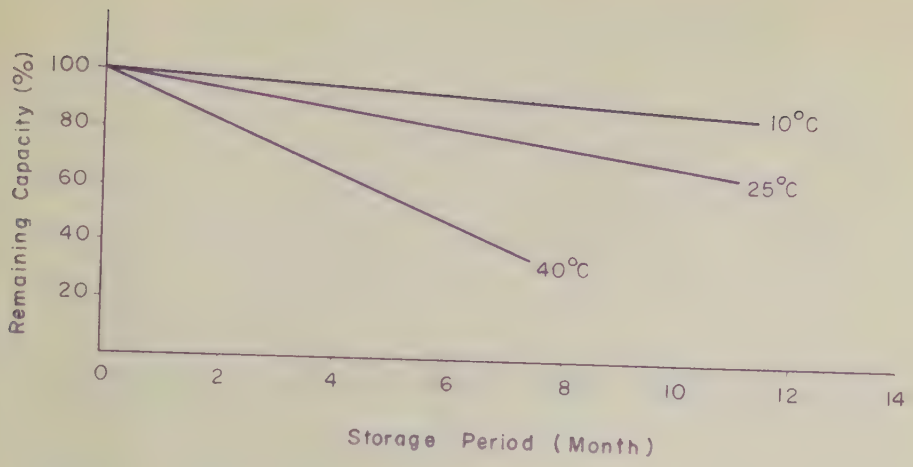
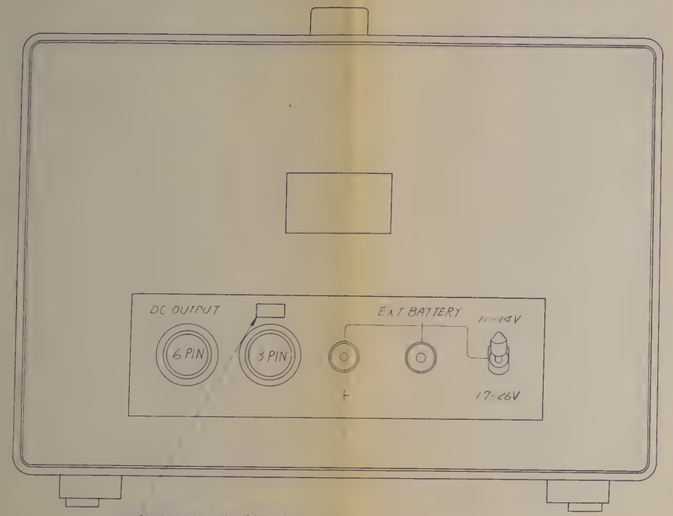
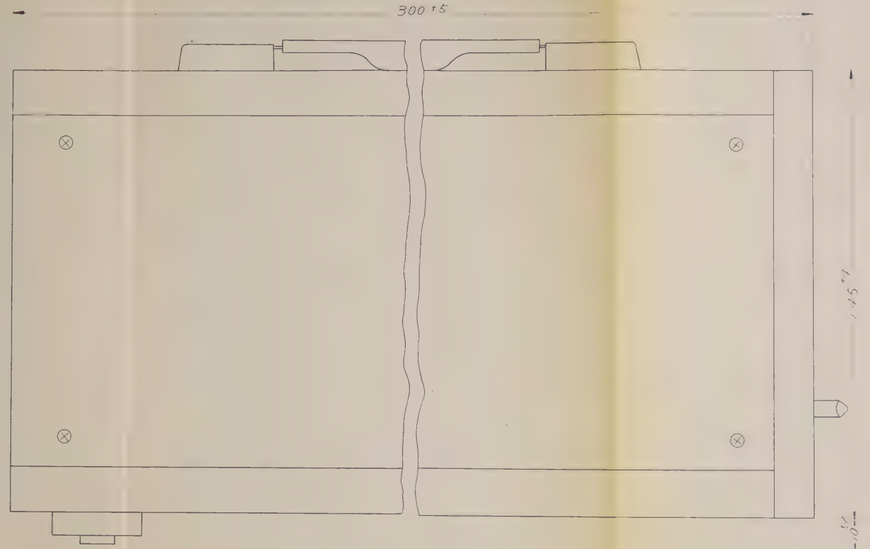


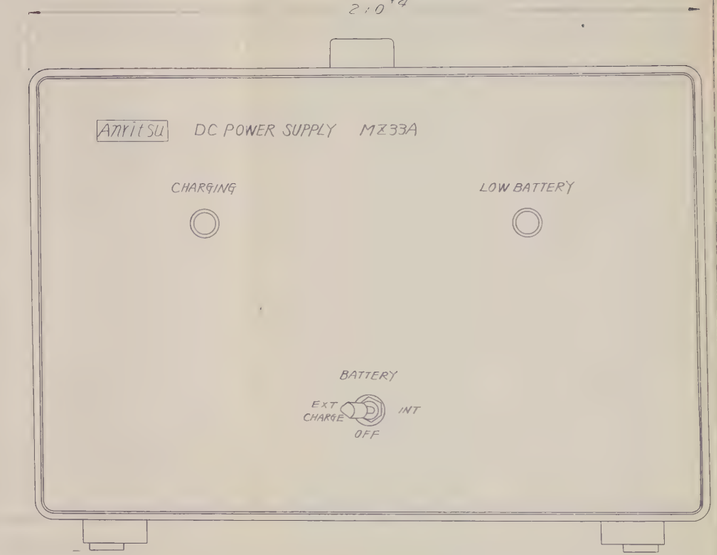
Fig. 5-4 Storage Characteristics
(Self-Discharge Characteristics)

The storage characteristics depend upon temperatures. However, a battery which has been discharged during storage can be recharged and restored to full capacity; thus there is no chance that the battery will become unusable.



POWER SUPPLY VOLTAGE DESIGNATION





設計	関口	80.8.20	製図			尺度	1/1
承認	斉藤	80.8.21	手つか	80.8.20			

FRONT VIEW AND OTHER VIEWS OF DC POWER SUPPLY MZ33A

38W3384

COMPONENT LIST OF DC POWER SUPPLY MZ33A

CIRCUIT REF.	DESCRIPTION	RATING		NOTE
C 1	Capacitor, fixed, plastic film (ECQ-M05 104KZ)	0.1μF ±10%, 50V		
C 2	Capacitor, fixed, solid electrolyte, tantalum (CS02H1A4R7M)	4.7μF ±20%, 10V		
C 3	Capacitor, fixed, solid electrolyte, tantalum (CS02H1C220M)	22μF ±20%, 16V		
C 4	Capacitor, fixed, solid electrolyte, tantalum (CS02H0J6R8M)	[illegible] μF ±20%, 6.3V		
C 5	Capacitor, fixed, electrolyte aluminum (CE02B1E471X)	[illegible] μF [illegible], 25V		
C 6	Capacitor, fixed, electrolyte aluminum (CE02B0J221X)	220μF +100% - 10%, 6.3V		
C 7	Not assigned			
C 8	Not assigned			
C 9	Capacitor, fixed, electrolyte aluminum (CE02B1J220X)	22μF +100% - 10%, 63V		
C 10	Capacitor, fixed, electrolyte aluminum (CE02B1J100X)	10μF +100% - 10%, 63V		
C 11	Capacitor, fixed, electrolyte aluminum (CE02B1J220X)	22μF +100% - 10%, 63V		
C 12	Capacitor, fixed, electrolyte aluminum (CE02B1J100X)	10μF +100% - 10%, 63V		
C 13	Capacitor, fixed, plastic film (ECQ-M05 104KZ)	0.1μF ±10%, 50V		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF DC POWER SUPPLY MZ33A

CIRCUIT REF.	DESCRIPTION	RATING		NOTE
F 1	Fuse (MF61NN250V1A AC05)			
F 2	Fuse (MF61NN32V10ADC05)			
J 1	Connector (RM12BRD-3P)	3 pins		
J 2	Terminal (349H7025C)			
J 3	Terminal (349H7025C)			
J 4	Connector (RM12BRD-6S)	6 pins		
K 1	High sensitive relay (ME101-0)	DC12V		With protective cover
K 2	Reed relay (MT03A)			
L 1	Choke coil (TF3320C-601Y3R5)			
L 2	SF coil (SF-T8-50S)			

( ) : Manufacturer's part number

* : Selected at factory

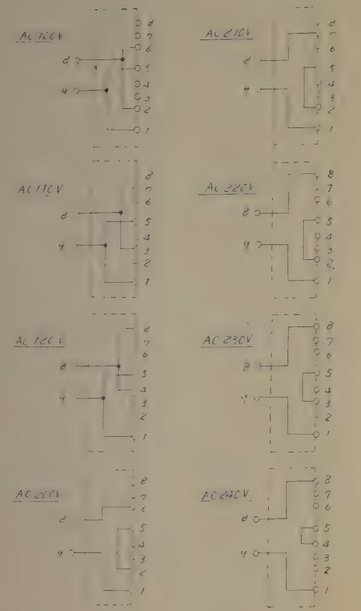
COMPONENT LIST OF DC POWER SUPPLY MZ33A

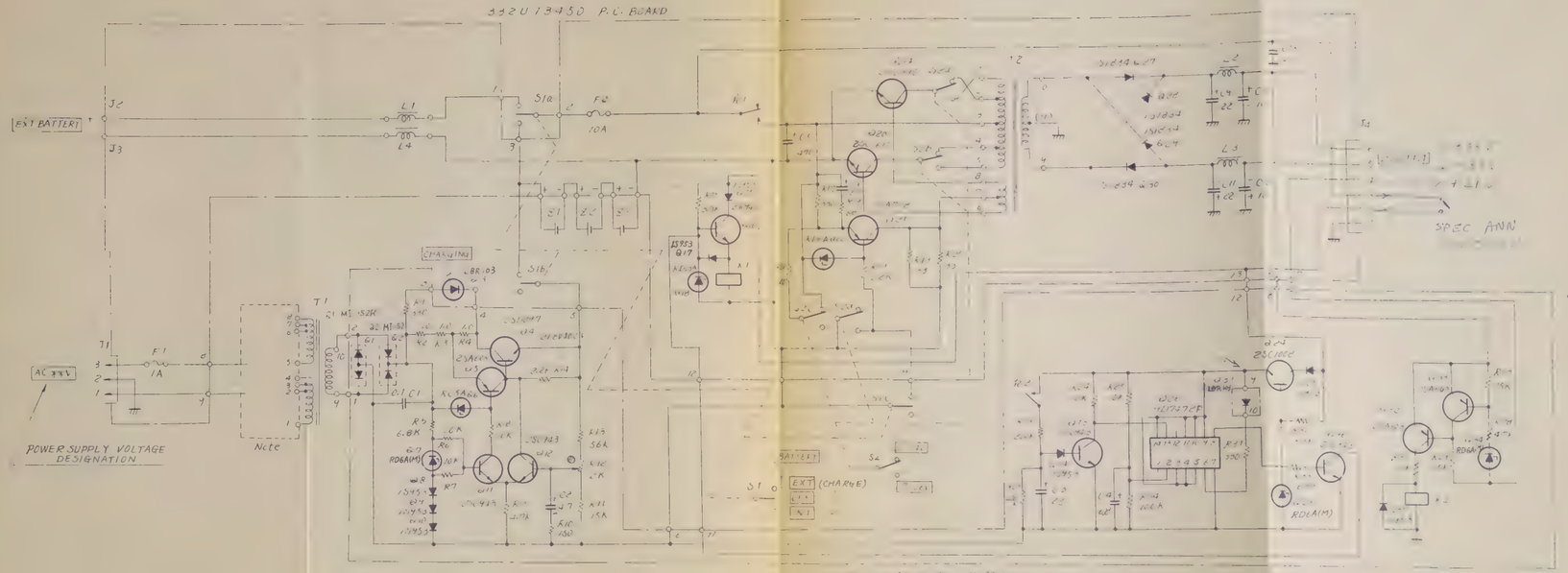
CIRCUIT REF.	DESCRIPTION	RATING		NOTE
L 3	SF coil (SF-T8-50S)			
L 4	SF coil (SF-T12-5( )			
Q 1	Diode, Si (MI-152R)			
Q 2	Diode, Si (MI-152)			
Q 3	Light emitting diode (LBR103)			
Q 4	Transistor, Si, NPN (2SD297)			
Q 5	Transistor, Si, PNP (2SA603)			
Q 6	Diode, breakdown (RD5A (M))	4.3 to 5.4V 250mW		
Q 7	Diode, breakdown (RD6A)	5.2 to 6.4V 250mW		
Q 8 to Q 10	Diode, Si (1S953)			
Q 11	Transistor, Si, NPN (2SC943)			
Q 12	Transistor, Si, NPN (2SC943)			
Q 13	Not assigned			
Q 14	Not assigned			

( ) : Manufacturer's part number

* : Selected at factory

Note: This circuit is differentiated by means of power supply voltage.





CIRCUIT DIAGRAM OF DC POWER SUPPLY M233A

38W3382 1/1

CIRCUIT REF.	DESCRIPTION	RATING		NOTE
Q 15	Diode, Si (1S953)			
Q 16	Transistor, Si, NPN (2SC943)			
Q 17	Diode, Si (1S953)			
Q 18	Diode, breakdown (RD13A)	11.0 to 14.5V 250mW		
Q 19	Transistor, Si, NPN (2SC1610)			
Q 20	Transistor, Si, NPN (2SC1610)			
Q 21	Transistor, Si, PNP (2SA708)			
Q 22	Diode, breakdown (RD6A)	5.2 to 6.4V 250mW		
Q 23	Diode, breakdown (RD6A (M))	5.2 to 6.4V 250mW		
Q 24	Transistor, Si, NPN (2SC1008)			
Q 25	Diode, Si (1S 53)			
Q 2	I.C. (HD7472P)			
Q 27 to Q 3	Diode, Si (1S1834)			
Q 31	Light emitting diode (LBR103)			
Q 32	Transistor, Si, PNP (2SA603)			
Q 33	Transistor, Si, (2SA603)			

( ) : Manufacturer's part number

* : Selected at factory

CIRCUIT REF.	DESCRIPTION	RATING		NOTE
Q 34	Diode, breakdown (RD6A)	5.2 to 6.4V 250mW		
Q 35	Diode, Si (1S953)			
Q 36	Transistor, Si, NPN (2SC943)			
R 1	Resistor, fixed, C.F. (RD1/8PY 330ΩJ)	330Ω, ±5% 1/8W		
R 2 to R 4	Resistor, fixed, (MPC-71 1.0ΩK)	1.0Ω, ±10% 1W		
R 5	Resistor, fixed, C.F. (RD1/8PY 6.8kΩJ)	6.8kΩ, ±5% 1/8W		
R 6 to R 8	Resistor, fixed, C.F. (RD1/8PY 10kΩJ)	10kΩ, ±5% 1/8W		
R 9	Resistor, fixed, C.F. (RD1/8PY 4.7kΩJ)	4.7kΩ, ±5% 1/8W		
R 10	Resistor, fixed, C.F. (RD1/8PY 150ΩJ)	150Ω, ±5% 1/8W		
R 11	Resistor, fixed, C.F. (RD1/8PY 15kΩJ)	15kΩ, ±5% 1/8W		
R 12	Resistor, variable, C.F. linear taper (TR10KB 2kΩ)	2kΩ		
R 13	Resistor, fixed, C.F. (RD1/8PY 56kΩJ)	56kΩ, ±5% 1/8W		
R 14	Resistor, fixed, C.F. (RD1/8PY 2.2kΩJ)	2.2kΩ, ±5% 1/8W		

( ) : Manufacturer's part number

* : Selected at factory

CIRCUIT REF.	DESCRIPTION	RATING		NOTE
R 15	Resistor, fixed, C.F. (RD1/8PY 3.3kΩJ)	3.3kΩ, ±5% 1/8W		
R 16	Resistor, fixed, C.F. (RD1/8PY 220kΩJ)	220kΩ, ±5%		
R 17	Resistor, fixed, C.F. (RD1/8PY 330ΩJ)	330Ω, ±5% 1/8W		
R 18	Resistor, fixed, C.F. (RD1/8PY 68ΩJ)	68Ω, ±5% 1/8W		
R 19	Resistor, fixed, C.F. (RN14K2H 330J)	33Ω, ±5% 1/2W		
R 20	Resistor, fixed, C.F. (RN14K2H 330J)	33Ω, ±5% 1/2W		
R 21	Resistor, fixed, C.F. (RD1/8PY 2.2kΩJ)	2.2kΩ, ±5% 1/8W		
R 22	Resistor, fixed, C.F. (RD1/8PY 220ΩJ)	220Ω, ±5% 1/8W		
R 23	Resistor, fixed, C.F. (RD1/8PY 220kΩJ)	220kΩ, ±5% 1/8W		
R 24	Resistor, fixed, C.F. (RD1/8PY 10kΩJ)	10kΩ, ±5% 1/8W		
R 25	Resistor, fixed, C.F. (RD1/8PY 10kΩJ)	10kΩ, ±5% 1/8W		
R 26	Not assigned			
R 27	Resistor, fixed, C.F. (RD1/8PY 15kΩJ)	15kΩ, ±5% 1/8W		
R 28	Resistor, fixed, C.F. (RD1/8PY 4.7kΩJ)	4.7kΩ, ±5% 1/8W		
R 29	Resistor, fixed, C.F. (RD1/8PY 15kΩJ)	15kΩ, ±5% 1/8W		

( ) : Manufacturer's part number

* : Selected at factory

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